REMARKS/ARGUMENTS

Claims 2, 5, 6, 12, 13, 16, 19, 20, 22, 26, 27, and 30 are amended, claims 1, 7, 10, 11, 15, 21, 24, 25, and 29 are canceled, and claims 31-36 are added herein. With entry of this amendment, claims 2, 4-6, 8, 12-14, 16, 18-20, 22, 26-28, and 30-36 will be pending.

Claims2, 5-6, 8, 12-14, 16, 19-20, 22, 26-28, and 30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,879,594 (Lee et al.) in view of U.S. Patent Application Publication No. 2008/0181224 (Van Hensbergen et al.) and U.S. Patent No. 6,538,997 (Wang et al.). Claims 4 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Van Hensbergen et al., Wang et al., and U.S. Patent Application No. 2005/0080901 (Reader).

Claims 2, 16, and 30 are directed to a method, computer-readable storage medium, and apparatus for operating a node in a layer 2 network to handle multicast traffic. Claims 2, 16, and 30 have been amended specify receiving multicast traffic addressed to the multicast distribution group and forwarding the multicast traffic via the multicast distribution tree.

Lee et al. disclose a system for loop avoidance in multi-protocol label switching. The system operates at a label switching router on a label switched path (see, for example, Fig. 1). In the Background of the Invention, Lee et al. refer to a standard spanning tree procedure defined for network bridging devices and note that a plurality of switches interconnected by trunks may be arranged to form a spanning tree.

Lee et al. do not show or suggest establishing state information for a multicast distribution group based on a join message, if such state information has not already been established, or adding a port to a port list associated with state information, the port list being used to select ports for forwarding received multicast traffic of the multicast distribution group. Lee et al. describe binding a particular label to a particular

forwarding equivalence class. If a receiver receives a label splice message and it already has a pending splice, there is a possibility of a loop forming and action is taken so that the receiver does not receive an acknowledgement. There is no teaching in Lee et al. of establishing state information for a multicast distribution group based on a join message or adding a port to a port list associated with state information.

The state information of applicants' claimed invention is used so that a switch knows which port to use to forward towards an attraction point and is based on the topology of the spanning tree. Multicast packets are forwarded based on the state built up by the join messages. Relatively few resources are required to maintain state on the switches. A large number of sources may be readily accommodated because traffic can flow upward from the sources towards the attraction point without prior state creation.

Furthermore, as noted by the Examiner, Lee et al. do not disclose forwarding multicast traffic from a switch within a layer 2 network, via a multicast distribution tree.

Van Hensbergen et al. disclose a system for distributing block data on a private network without using TCP/IP. In rejecting the claims, the Examiner refers to paragraph [0042], which describes how switches allow devices on the network to broadcast or multicast data to other devices. Van Hensbergen et al. note that switches forward all multicast traffic to all their ports, except the port on which the data arrives and that a system administrator may program a switch to forward certain data traffic to certain ports to create a virtual LAN within the switched infrastructure. Van Hensbergen et al. do not show or suggest forwarding multicast traffic from a switch within a layer 2 network, via a multicast distribution tree. Instead, Van Hensbergen et al. forward multicast traffic to all of the switch's ports, except the receiving port. This is a highly inefficient use of network resources. In contrast to Van Hensbergen et al., applicants' invention dynamically creates a multicast distribution tree to ensure distribution to intended receivers while limiting distribution so that network segments that are not in the path between the source and receivers are not burdened with unnecessary traffic.

Wang et al. disclose a method for troubleshooting a path which includes a set of layer 2 and layer 3 devices. When a node receives a packet that includes an indicator that a trace is to be performed, the node inserts data into the packet and transmits the packet to another node in the path. The trace packets are sent along a path towards a trace response node or destination (Fig. 2). Wang et al. simply trace a predefined path. Wang et al. do not forward multicast traffic, instead they transmit trace packets in a hop-by-hop process. Furthermore, there is no use of attraction points.

Accordingly, claims 2, 16, and 30 are submitted as patentable over Lee et al., Van Hensbergen et al., and Wang et al.

Claims 4-6, 8, and 31-33, depending from claim 2, and claims 18-20 and 22, depending from claim 16, are submitted as patentable for at least the same reasons as their base independent claims.

Claims 5 and 19 are further submitted as patentable over the cited references which do not show or suggest flooding a join message via a spanning tree. Wang et al. refer to flooding a frame over all outgoing ports if a bridge does not know over which port a particular unicast address is reachable. Applicants' invention sends join messages on each port that participates in the spanning tree other than the port on which the join message was received. This is not the same as sending a join message on all ports since some links of a mesh network will not be part of the spanning tree so as to avoid loops. The use of a loop-free spanning tree provided by the operative spanning tree protocol allow flooding of join messages without concern about routing loops. Forwarding of multicast data traffic is optimal since a data packet is not sent via a branch which does not have any interested routers.

Claims 6 and 20 are further submitted as patentable over the cited references which do not show or suggest forwarding a join message via one or more ports which an attraction point advertisement message was previously received. As discussed further below, the cited references do not teach attraction point advertisement messages.

Claims 12 and 26 have been amended to specify forming a multicast distribution tree based on a spanning tree defined within a layer 2 network and that the advertisement message comprises an IP address of the neighbor node and the MAC address assigned to the multicast distribution group. Claims 13 and 27 have been amended to specify flooding advertising messages.

The Examiner has failed to point to any teaching of flooding an advertisement message establishing a node as an attraction point for a multicast distribution group. In rejecting claims 12, 13, 26, and 27, the Examiner simply points to the rejection of claim 1, however, this limitation was not included in claim 1. Conventional multicast distribution is sent to a specified receiver or forwarder, thus, there is no need to advertise an attraction point for multicast traffic addressed to a multicast distribution group.

Applicants' invention, as set forth in the claims, is particularly advantageous in that the advertisement messages efficiently build up a multicast distribution tree. Forwarding of multicast data traffic is optimal since a data packet is not sent via a branch which does not have any interested routers.

Accordingly, claims 12, 13, 26, and 27, and the claims depending therefrom, are submitted as patentable over the cited references.

The other references cited, including U.S. Patent Application No. 2005/0080901 (Reader) fails to overcome the deficiencies of the primary references.

Claims 13 and 27 are further submitted as patentable over the cited references which do not show or suggest an attraction point that is a first hop switch connected to a source node.

For the foregoing reasons, Applicants believe that all of the pending claims are in condition for allowance and should be passed to issue. If the Examiner feels that a telephone conference would in any way expedite prosecution of the application, please do not hesitate to call the undersigned at (408) 399-5608.

Respectfully submitted,

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